Avoiding structural disputes *

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SUMMARY: *Scope of work, quality, cost and time are aspects of every construction contract, in which a perceived shortfall in the expected outcome for any one can result in a dispute. The importance of managing these issues in accordance with the requirements of the contract is stressed in this paper, and illustrated by reference to past projects. The paper also highlights the fundamental importance of implementing appropriate contractual conditions, including risk allocation, and notes certain aspects of contracts that can influence the likelihood of disputation arising from unfulfilled expectations. Suggestions are made for mechanisms that can minimise the impact of disputes that do arise.*

1 INTRODUCTION

A successful project is one that fulfils the performance expectations of the project participants. Successful projects do not result in disputes. A project that is unsuccessful in some respect manifests a "failure": an "unacceptable difference between expected and observed performance". Projects that have "failed" frequently result in disputes, because one or more project participants are unhappy with the outcome.

What sort of "failures" result in disputes? It is suggested that any perceived shortfall in the expectations of a project participant with respect to scope of the work, time, cost or quality can result in a dispute. Moreover, any unexpected event that adversely impacts on project objectives has the capacity to make someone unhappy if the consequences are unexpected or have not been planned for. Thus, the materialisation of any risk is a potential causative factor for a dispute.

A theme of this paper is that the lessons from the past are an invaluable guide to avoiding structural disputes in the future. It is suggested that there are two essential aspects to this: the project management/engineering and the legal/contractual, and these are inextricably intertwined. A project without disputes can only occur if the engineering and construction are not only executed successfully, but in a way that the parties have agreed as formalised in the relevant contracts. The proper planning and execution of contractual issues are therefore as important as the proper management of the project and the engineering in avoiding disputes.

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2 TIME, COST AND QUALITY

It is suggested that the hallmark of successful projects is not only the engineering quality, but also that the time and cost issues are successfully managed within the expectations of the project participants. Although engineers traditionally project managed the delivery of projects, in this age of specialisation project management and engineering are now seen as distinct professions. In the author's view the essential distinction is that the project manager is focused on the management of time, cost and quality (in that order), whereas for the engineer quality is the overriding criterion, followed by cost, with time sometimes a distant third. The project manager's priorities are the client's priorities: the project completed on time and on budget, and with appropriate quality so as to fulfil the purpose for which it was created. Achievement of the required quality, in the sense of the engineering performing to expectations and avoiding structural failure, is taken for granted as an essential part of the engineer's function.

The engineer generally focuses on quality, not least because in many projects without the required quality the project will fail catastrophically, often with substantial loss of life. A significant failure of quality (an "engineering failure"), particularly if it results in structural failure, almost inevitably leads to a dispute. The study of engineering failures has always been an important part of the art of structural engineering, and virtually every significant engineering failure is subsequently analysed to determine lessons for the future. For example, the Standing Committee

on Structural Safety (SCOSS) is a UK organisation whose function is to identify issues that might contribute to increasing risks relating to structural safety, and this includes analysing the causes of structural failures. SCOSS sponsors Confidential Reporting on Structural Safety (CROSS), which aims to improve structural safety and reduce failures by using confidential reports to highlight lessons that have been learnt, and to generate feedback and influence change. SCOSS and CROSS produce a range of publications available on the internet, and these form an invaluable resource for structural engineers on the lessons from past failures.

However, a failure of quality is not the only cause of structural disputes. A failure to deliver the project scope as anticipated by the client, or failure to deliver it on time or on budget, can and frequently do lead to disputes, even though the engineering quality is satisfactory. There are many examples from around the world of projects that, while delivering the required engineering quality, were not completed on time or within budget. Examples of high-profile and ultimately technically successful structures that substantially exceeded their budget cost and/or their projected completion date include the Sydney Opera House, the Channel Tunnel, the new Wembley Stadium and Southern Cross Station in Melbourne. Some of these cost and/or time overruns resulted in legal disputes. The recently completed Scottish Parliament House, while the recipient of architectural awards, ultimately cost over 10 times the original budget and was years late in opening. This "failure" in procurement of the project resulted in a public enquiry that analysed the reasons for the time and cost overrun, usefully summarising the contributing factors, many of which are relevant to other projects (Charrett, 2008).

The appropriate management of scope, time, cost and quality during the execution of a project to avoid "failure" are essentially project management/engineering issues. However, each of these issues is also a fundamental aspect of the contractual arrangements involved in the structural engineering of any project. A properly drawn contract for design and or construction of a structure should have terms that unambiguously define the scope of the parties' obligations as not only what is to be constructed or designed (scope of the work), but also the time within which it is to be done, the price to be paid and the quality required. It is trite to observe that the project management/engineering must be executed within the parameters defined by the parties in order to avoid breaching the contract and providing grounds for a valid dispute.

3 RISK

Risk is defined in AS/NZS 4360:2004 as "the chance of something happening that will have an impact on objectives". The assessment and management of risks associated with known, unexpected or unforeseen events is fundamental to structural engineering; structures cannot be designed for all possible natural events or misuses, but there is an expectation that professional expertise will be applied in "engineering out" risks to the extent feasible and practicable.

The materialisation of an adverse risk may lay the foundations for a potential dispute, since in the eyes of at least some project participants it may be seen as an unacceptable difference between expected and observed performance, ie. "failure" according to the definition given above. This is more likely if all project participants do not have an understanding of the risks and their consequences, of whose responsibility it is for managing particular risks, and acceptance of the measures that have been adopted to treat them. It is suggested that communication on risks between all project parties is imperative to avoid the type of misunderstandings that can result in disputes.

The subject of formal risk analysis and management is growing in importance as one of the "tools of trade" of the structural engineer. Indeed SCOSS has recommended that: "Starting at the design stage of projects, designers should apply an explicit risk management process including identification of hazards and assessment of risks, with the effort expended and sophistication of the assessment being directly related to the nature, size and importance of the structure" (SCOSS, 1997). Minimisation of risk of structural failure is also implicit in the current attention given to "robustness" in the design of structures. Properly executed and communicated, such formalised approaches to risk management can only assist in avoiding structural disputes.

While risk assessment and management are essentially project management/engineering issues during execution of a project, it is a fundamental role of the relevant contract to allocate risk, ie. to define who bears the consequences if the chance of an adverse event materialises. Such risk allocation, agreed at the start of a project, is an essential part of each party's expectations of the way the project will be executed. Misunderstanding as to which contract party bears the consequences of a particular event occurring are a frequent source of disputes.

4 LESSONS FROM PROJECT FAILURES

Failures (in the broad sense of an unacceptable difference between expected and observed scope, time, cost or quality performance) occur on projects of all sizes, and are frequently manifested by disputes decided in court or by arbitration. The causes are not only technical issues but also "soft" management issues. Many failures are caused by human failings, particularly failures of communication, and many are the result of a combination of causes. The study of the causative factors involved in past failures and

disputes is instructive in pointing the way to avoid such failures (and the likely potential for disputes) in the future. Such factors include both project management/engineering and legal/contractual, which include issues related to the method of project procurement. The following examples illustrate that a shortfall in expectations in respect of time, cost or quality in the delivery of a project constitutes a "failure" in the view of the least some project participants, and such perceptions may lead to a dispute.

4.1 Inadequate management of time

CFW Architects (A Firm) v Cowlin Construction Ltd (2006) EWHC 6 (TCC) is a case that highlights the importance of designers producing the documents in accordance with the agreed time schedule. An architectural firm CFW was engaged to prepare the architectural design and drawings for Cowlin to construct a number of houses under the provisions of a design and construct contract with the Defence Housing Executive in the UK. In addition to the standard RIBA conditions of engagement, there was an implied contractual term that the architect agreed that it would produce its drawings in accordance with a schedule that would not delay the contractor from completing its work within the time specified in the design and construct contract. In the event, the architect failed to produce the drawings to the required schedule, with the result that the contractor completed its work many weeks late, and was subject to substantial liquidated damages. In finding that the architect was liable in damages for breach of its design contract with the contractor for its failure to deliver the drawings timeously, the judge not only relied on the implied contractual term in respect of time, but also imported this requirement into its professional duty to exercise the reasonable degree of skill and care required by law.

Construction contracts typically contain liquidated damages provisions for failure to complete construction on time, and timely performance by a design and construct contractor is clearly dependent on receiving the design information at the appropriate time. This case highlights the substantial risks borne by a designer in providing the required design information at the appropriate time. It is a risk that is within the control of the designer and must be managed appropriately to avoid disputes.

4.2 Inadequate management of cost

John Holland Construction & Engineering Pty Ltd v Kvaerner RJ Brown Pty Ltd (1997) 13 BCL 262 involved a claim for damages by a design-construct contractor from its design consulting engineer in relation to a lump sum turnkey contract for process skids for floating production storage offloading facilities in WA. The contractor entered into a pre-bid agreement with the engineer for it to carry out the specialist design and engineering services for the preparation of the contractor's bid to the Principal. Following project completion, the contractor claimed damages for, inter alia, breach of the pre-bid contract from the engineer, claiming extra costs the contractor alleged it had incurred in executing its contract, above the cost estimates on which it had based its tender. The case reported was an application to strike out substantial parts of the contractor's statement of claim, and the fundamental question of whether the designer had any liability for the contractor's cost overrun was ultimately not decided. However, significant parts of the contractor's multimillion-dollar claim were allowed to stand, indicating that it had an arguable case against the engineer that would be given serious consideration by the court.

This case demonstrates several areas of potential dispute in design and construct contracts: what are the obligations of a designer in respect of a preliminary design prepared for a contractor's tender, and who bears the risk of the cost of the constructed design exceeding the reasonable cost of the preliminary design on which the contractor committed to a fixed-price lump sum contract?

4.3 Inadequate management of quality

Ronan Point was a 23-storey tower block of flats in East London that suffered a partial collapse in 1968 following a gas explosion. The structure was made of prefabricated concrete panels, cast offsite and bolted together on site. The public inquiry into the collapse concluded that there was no evidence that the design of Ronan Point did not broadly comply with the Byelaws and Codes of Practice. However, in subsequent litigation (*London Borough of Newham v Taylor Woodrow-Anglian* (1982) 19 BLR 111) the judges found that because of insufficient reinforcing at the joints between panels, the design failed to comply with the relevant Codes of Practice and thereby breached the building Byelaws. The designers were found not liable in negligence, but the failure to comply with the byelaws was a breach of contract, and the contractor was held liable for the costs of rectification.

This case illustrates a dispute arising from a failure to deliver the quality of building required to avoid collapse from an unforeseen event, and emphasises the importance of strict conformance with contractual conditions.

5 THE IMPORTANCE OF THE CONTRACT

The actual terms of the contract that the parties to a construction project enter into will govern their contractual relationship for the duration of the contract and in respect of its termination. Those terms can be very one-sided, unreasonable and unfair, but if that is the bargain that the parties have made (and it

is not contrary to public policy or statute), a court or an arbitrator will enforce it strictly in accordance with its terms. A party signing up to any contract should be under no illusions as to the likely outcome of terms that favour the other party: it should be assumed that those terms will be administered and enforced to achieve the expressed contractual intention. Even in the context of partnering or alliance contracts, it would be naive to assume that the formal contract will be "tucked away in a drawer" and not used in the event that there are disputes.

Given this fundamental importance of the contract, it is suggested that the first step in avoiding disputes in any project is to ensure that the contract terms are satisfactory to the contracting parties, *before* the contract is executed. A contract containing terms in respect of scope, time, cost or quality that are known to be unachievable from the outset will provide fertile ground for a dispute. So too will a contract that allocates risk to a party that is unable to influence or control it, where materialisation of the risk would have significant consequences. Whatever the project challenges and attractions might be, a contract with inappropriate terms may be doomed to failure and consequent dispute. The importance of negotiating satisfactory contract terms (or if necessary walking away) should not be underestimated, as the contract forms the foundation for all of the subsequent project dealings between the parties and defines each party's legal obligations.

Following the building boom in the late 1980s, the number of claims and disputes in the building and construction industry increased significantly. The government and private sectors met to determine ways of reducing the incidence of such claims and disputes. Following an overseas study tour, a wide ranging joint working party was formed by the private and public sectors to investigate ways of reducing claims and disputes in the industry, culminating in the publication of *No Dispute* (NPWC/NBCC, 1990). This document outlined best practice in the preparation of documents for tendering, selecting contractors and the contents of the contract itself. It suggested other improvements, such as alternative project procurement strategies, quality assurance and alternative dispute resolution practices, such as mediation, conciliation, etc. Importantly, *No Dispute* advocated that a balanced risk allocation should be incorporated into construction contracts, by adopting the Abrahamson risk allocation principles to achieve a fair risk allocation between the competing commercial interests of the Principal and the contractor. The Abrahamson principles are summarised as: "a party to a contract should bear a risk where that risk is within that party's control"; in other words "the Principal should not ask the Contractor to price unquantifiable risks within the control of the Principal" (Pilley, 2001). The principles of dispute avoidance enshrined in *No Dispute* are as applicable today as when they were first published, but in the author's experience are often not reflected in contracts.

The Abrahamson principles of balanced risk allocation have been incorporated into the Australian Standard suite of construction contracts based on AS4000-1997 General conditions of contract (Pilley, 2001). In the USA, over 20 leading construction associations, representing owners, contractors and subcontractors recently cooperated to produce a standard suite of construction contracts intended to be fair to all parties. ConsensusDOCS is a suite of contracts that aims to represent the best interests of the project, rather than a single party, employing best practices and fair risk allocation for all parties. These contracts are focused on "yielding better project results and fewer disputes". In the author's view, the adoption of such standard form contracts produced on a consensus basis by representatives of all facets of the construction industry is likely to result in fewer disputes than the use of "bespoke" contracts prepared to advance the interests of only one contracting party.

6 MANAGEMENT OF THE PROJECT

It is trite to observe that as the contract defines the scope, time, cost and quality obligations in the delivery of a project, any failure to fulfil those contractual requirements may give rise to a dispute. The obverse is that if the execution of the project works is carried out in accordance with the requirements of the contract as understood by all parties, there will be no valid grounds for a dispute. Project management and engineering must therefore be focused on fulfilling the requirements of the contract, and this entails familiarity with those requirements. It is suggested that all personnel involved in project delivery should be familiar with those parts of the contract that are relevant to their work, since the specific requirements may be different to those on the last project.

The importance of warning the Principal of risks cannot be overemphasised, as failure to warn in circumstances where the engineer knows of a risk could result in a dispute in which the engineer may be found liable. An example of this was a swimming pool constructed in Coode Island Silt (CIS) in Melbourne. A piled foundation would have eliminated the risk of construction in the CIS, but the designing engineer perceived that the client was not prepared to pay the higher cost of piling, and therefore designed the swimming pool to be supported by the CIS without piles. The engineer failed to warn the client of the risk of movement due to the nature of the soil. This risk materialised, and the swimming pool suffered substantial movement and cracking. The engineer was found to be negligent in its failure to warn the Principal of the risk of movement. The Principal was thereby denied the opportunity of assessing whether it was prepared to make the additional investment in piles to eliminate

the risk of movement from the CIS. The message from this case is clear: it is necessary to advise the Principal the basis of design and explain the inherent risks that are known, so that the Principal can make an informed decision on the trade-off between risk and level of investment s/he wishes to make.

Unless an engineer takes on a contractual responsibility to prepare a design that is fit for purpose (which may be the case in respect of a design and construct contract), s/he does not normally warrant the adequacy of the design or its performance. The common law only requires that the engineer exercise the degree of skill and care of the ordinary competent person practising as an engineer in preparing the design. Subject to the specific requirements of the contract and adequately advising the Principal of the risks involved, engineers should therefore not necessarily be deterred from innovation that offers the prospect of substantial benefits, but nevertheless involves more than normal risk because of the inherent unknowns in anything new. The law accepts that there are risks in innovation, and materialisation of such risks resulting in failure does not necessarily involve negligence on the part of the engineer.

7 DISPUTE RESOLUTION

Given the technical and legal complexities and the divergences between the interests of the parties in any major project, conflict and dispute at some level is perhaps almost inevitable. One of the challenges facing the parties is to ensure that their legal rights are adequately protected, without letting conflict and dispute adversely impact on successful execution of the project. It is suggested that these interests would be served by a provision in the contract for a streamlined and speedy process for the resolution of disputes that is independent of the contracting parties. One option for this would be an independent Adjudicator who would consider submissions from both parties on a disputed matter, and come to a speedy determination without the formality of a hearing or the preparation of lengthy documentation. If both parties accepted the Adjudicator's determination, it could become binding after, say, 28 days and that would be the end of the matter. If either party wished to challenge the determination, it could give notice within 28 days that it intended to implement the formal dispute resolution procedures provided for in the contract. However, to ensure that the parties were not further distracted from execution of the project by the significant work necessary to prepare for arbitration or litigation, the Adjudicator's determination could be binding on both parties until practical completion.

The use of adjudication to provide a speedy and at least temporary resolution of a dispute on any issue under the contract is an extension of the statutory adjudication currently provided for in respect of payment claims under the various Australian Acts for security of payment. It is similar to the wider use of statutory adjudication for all construction contract disputes undertaken under the provisions of the *Housing Grants, Construction and Regeneration Act 1996* (UK), which anecdotal evidence indicates has had a significant impact in reducing the number of disputes that have progressed to litigation in the courts.

On a major project, the concept of independent adjudication can be taken a step further by the appointment of a Dispute Adjudication Board (DAB), as provided for in the FIDIC construction contracts. A "full term" DAB is appointed at the time of project execution, and comprises one or three independent and widely experienced and respected members who become familiar with the project from its inception by reviewing progress and project documentation. The DAB is available to adjudicate on disputes at any time during the project. The experience of the use of DABs on major projects around the world has been that they are very successful in preventing the majority of disputes from becoming "full-blown" arbitration or litigation. This success depends in part on the stature of the members of the DAB, who need to be widely respected professionals with considerable experience in similar projects.

8 CONCLUSION

"Failures" in respect of scope, time, cost or quality can lead to disputes, and accordingly disputes can be avoided if project management and engineering are focused on avoiding failures and delivering the requirements of the contract. It is of fundamental importance that the relevant contractual provisions are achievable, and that the inherent risks are understood and are the responsibility of those best able to manage and control them. In view of the inherent potential for conflict on any major project, it is suggested that the use of an independent Adjudicator or DAB to provide a speedy preliminary resolution of disputes may be in the best interests of the project, and minimise the ultimate extent of disputes.

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